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CASE REPORT

Third ventricular tuberculoma mimicking as a tumor: Report of a very rare case

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ABSTRACT

Intracranial tuberculoma is a common neurosurgical problem in developing countries; however, intraventricular tuberculoma is a rare entity. Here, we report a rare case of third ventricular tuberculoma in a 21-year-old girl who presented with features of raised intracranial pressure. Radiological findings and management of third ventricular tuberculoma would be discussed and literature regarding such lesions will be reviewed.

Key words: Intracranial tuberculomas, third ventricular tuberculoma, transcallosal transventricular excision

Introduction

Tuberculomas of the central nervous system (CNS) occur at about 0.5-4%, whereas in underdeveloped countries this occurrence is about 15-30%.[1] Intracranial tuberculomas are more common in underdeveloped countries where tuberculosis is endemic.[2] It mainly affects children and young adults.[3]

Conditions that have been associated with the development of and an increase in CNS tuberculosis and tuberculoma include diabetes mellitus, pregnancy, AIDS, intravenous drug use, immunosuppression from advanced age, alcoholism, transplantation and chemotherapy.[3] Intracranial tuberculomas mostly occur in cerebral hemispheres,[4] but may be located anywhere inside the brain. Intraventricular tuberculomas are rare lesions and, among the intraventricular tuberculomas, third ventricular tuberculoma is extremely rare. Only one case of third ventricular tuberculoma has been reported in the literature so far[5] and this is the second one that is being presented here.

Case Report

A 21-year-old right-handed girl was brought to the emergency department with a history of sudden onset of unconsciousness for the last 6 h. The family members gave a history that she had been suffering from persistent headache and occasional vomiting for the last 3 months. On examination, she had GCS of 13 with bilateral papilloedema on funduscopy. There were no cranial and motor deficits. She was subjected to emergent cranial computed tomography (CT) scan. Plain CT scan of the brain revealed third ventricular mass with obstructive hydrocephalus [Figure 1a]. Biventricular peritoneal shunt (Chhabra medium pressure) was performed as an emergency procedure. Ventricular catheters were

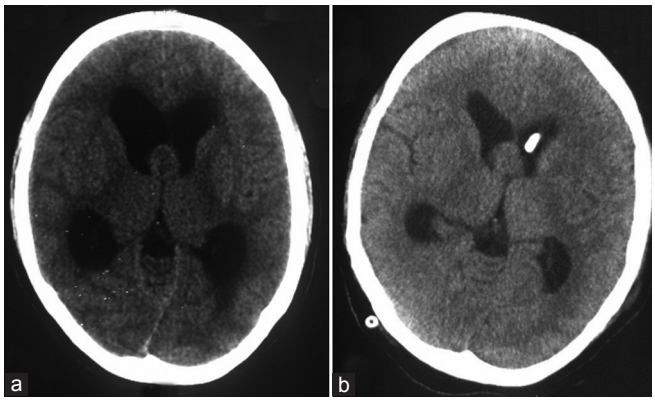

Figure 1: (a) Pre-operative plain axial computed tomography (CT) scan demonstrating isodense lesion in the anterior third ventricle with obstructive hydrocephalus. (b) Post VP shunt CT scan of the brain of the same patient

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placed in the left frontal horn at Kocher's point and in the right occipital horn at Frazier's point, and both were connected by a "Y" connector. Post-operatively, after ventriculoperitoneal shunt, she regained her conscious level and had no neurological deficit. The cerebrospinal fluid (CSF) sample that was collected during the shunting procedure was normal and there was no bacterial growth on culture of CSF. Post-operative CT scan of the brain showed decreased sizes of the ventricles [Figure 1b]. Her chest X-ray was unremarkable. Hematology and biochemistry were within normal limits. Serological test for HIV and hepatitis were negative. Magnetic resonance imaging (MRI) of the brain was carried out 1 week after the CSF diversion surgery, and it depicted third ventricular mass obstructing the Foramen of Monro, which was isointense on T1W and hypointense on T2W images. The lesion was homogenously enhanced after intravenous gadolinium injection [Figure 2a and b]. On clinical and radiological grounds, the diagnosis was made as neoplasm that could be a glial tumor, lymphoma or colloid cyst. Right frontal craniotomy and transcallosal, transventricular total excision of the tumor was performed. The tumor was smooth and round, firm in consistency, moderately vascular and attached to the Foramen of Monro [Figure 3]. The tumor was not breakable and not suckable, and was therefore removed as a single piece. The per-operative and post-operative periods were uneventful. After surgery, the patient had smooth neurological recovery and she was mobilized on the third post-operative day. Surprisingly, histological examination revealed granulomatous lesion with epitheloid and Langhans cells, consistent with tuberculoma [Figure 4]. Antituberculous drugs were started. Before discharge, MRI of the brain with intravenous contrast was ordered, and it showed no evidence of residual lesion, and Foramen of Monro was opened up [Figure 2c]. She was followed-up at 1 and 3 months at the neurosurgical OPD, and her neurological status was normal and had resumed her normal life.

Discussion

Tuberculosis of CNS has several clinical manifestations such as meningitis, epidural and subdural abscess formation and intracranial tuberculoma. Tuberculomas generally develop independent of tuberculous meningitis. However, the rupture of a tuberculoma may arise during the treatment of meningitis. The incidence of coexistent CNS tuberculoma and tuberculous meningitis is between 10% and 50%.[4,6] Tuberculomas are primarily located in the cerebral hemisphere, although tuberculomas have been found in the pituitary stalk,[1] sellar and suprasellar regions,[7-9] corpus callosum,[10] cavernous sinus,[11-13] brainstem,[14-18] cerebellum[19,20] and intraventricular.[21-23] Intraventricular tuberculomas are rare, and, among them, third ventricular tuberculoma is very rare; only one case has been reported in the literature.[5]

Routine hematologic evaluation, including total count and ESR, is often unremarkable in patients with intracranial tuberculomas. Examination of CSF is the most important laboratory analysis in the evaluation of tuberculous meningitis, but it is usually unhelpful in the evaluation of intracranial tuberculomas.[3] MRI is clearly superior to CT scan for all cases of intracranial tuberculomas.[24] MRI with gadolinium enhancement is usually the study of choice, although CT may be preferred before an emergency lumber puncture to rule out tuberculoma as a risk of brain herniation.

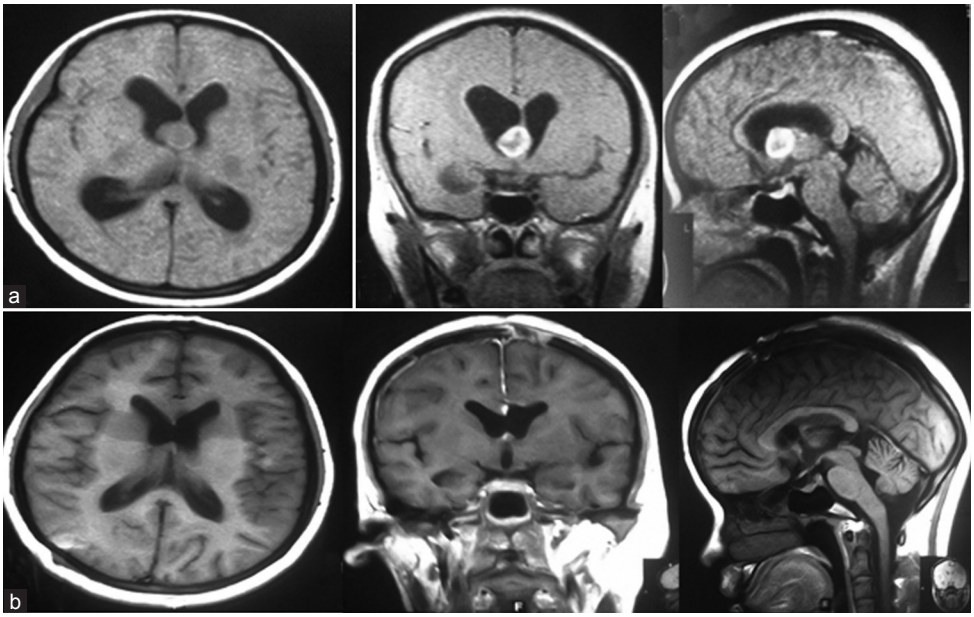

Figure 2: (a) Pre-operative magnetic resonance imaging (MRI) with sagittal cut after contrast showing well-enhanced third ventricular mass. (b) Post-operative MRI with contrast revealed on residual mass

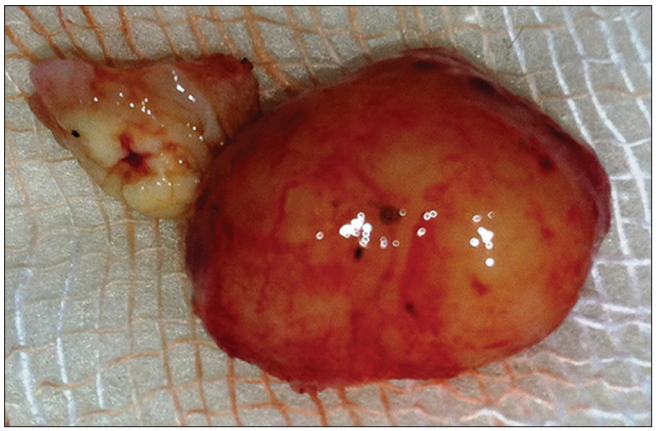

Figure 3: Surgical specimen, the mass was round, has smooth surface and firm in consistency, gray- white appearance upon sectioning

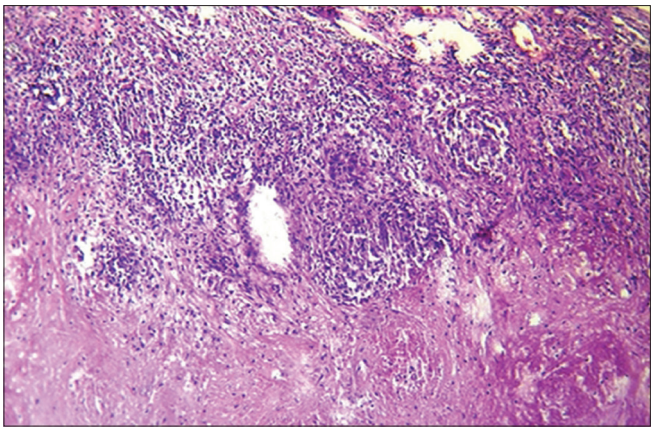

Figure 4: Photomicrograph (H and E, ×160) showing Langhans giant cells and epitheloid cells that are characteristic features of tuberculoma

The imaging characteristics of tuberculomas depend on their age, their viability and the presence of caseous necrosis or calcification. In an early granuloma with a viable center, a non-contrast CT may reveal a hypodense, isodense or even a slightly hyperdense area. After administration of contrast, the CT may show homogenous or ring-like enhancement.[25,26] On MRI, tuberculomas are usually hypointense on T1W or T2W images, although the center may be hyperintense on the latter. However, gadolinium-enhanced MRI usually reveals marked homogenous or ring enhancement.[27,28] MR spectroscopy may increase the specificity of diagnosis by identifying lipids within the lesion that one considered characteristic for tuberculoma, and has shown elevated lipid peaks within tuberculous lesions. Thus, MR spectroscopy may safely avoid the need of brain biopsy to confirm the nature of the lesion.[29] However, this imaging facility is not available in our institute at present.

This is the second case of histologically proven third ventricular tuberculoma, and the first such case was described by Singh JP and Chandy MJ in 1988.[5] In a 13-year-old girl, they had found enhancing third ventricular mass with obstructive hydrocephalus. After putting a unilateral left-sided ventriculoperitoneal shunt, they had partially excised the mass through a right frontal craniotomy and transcortical, transventricular approach, and biopsy proved to be as tuberculoma. Post-operatively, the girl did excellent recovery with a course of antituberculous drugs.

Third ventricular mass without evidence of tuberculous infection elsewhere in the body should undergo surgical excision, either transcallosal, transventricular or transcortical, or transventricular, which provides the histological diagnosis and creates a normal CSF pathway. Total excision is desirable so that the shunt system can be removed in the future in case of shunt complications like malfunctioning of shunt and infection, and the patient can be made shunt independent.

Surgical excision and a course of antituberculous drugs for 16-18 months are usually sufficient to cure such tuberculoma.

Tuberculoma should be kept in mind as one of the differential diagnoses along with primary and secondary neoplasms in any enhancing third ventricular mass, particularly in immunocompromised personnel and in patients from underdeveloped countries where tuberculosis is endemic.

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Conflicts of interest

There are no conflicts of interest.

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